

The ANTIQUE RADIO GAZETTE

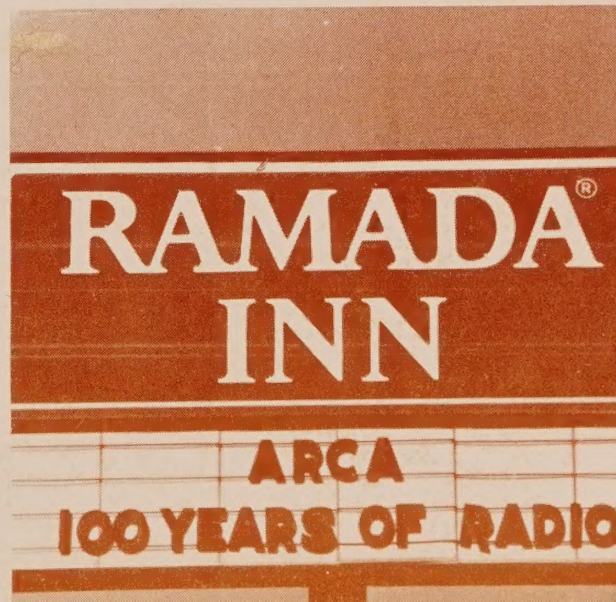
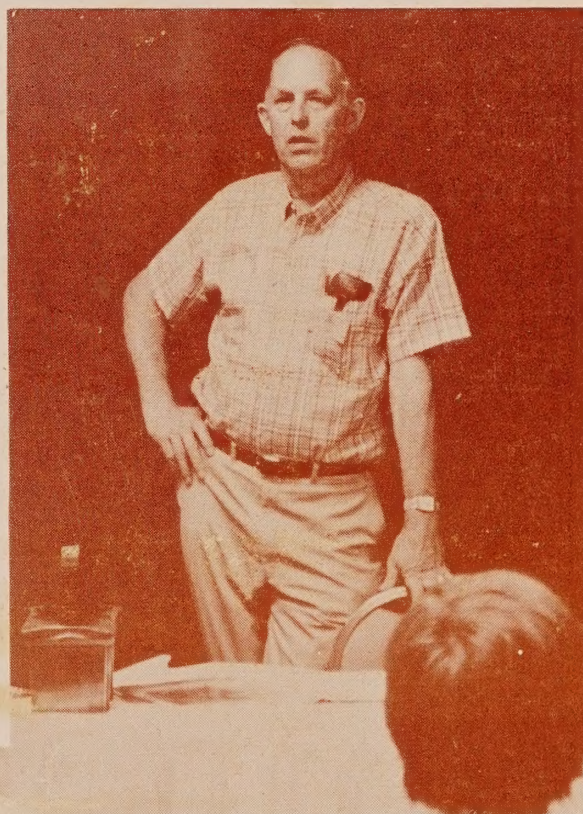


OFFICIAL
PUBLICATION OF
THE ANTIQUE
RADIO CLUB
OF AMERICA

VOL. 16

SUMMER 1988

NO. 2



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It is our intention to have the Gazette published as closely as possible to the following dates:

March 31
September 30

June 30
December 30

The closing dates for receiving material of all kinds in order to have it appear in the next issue would be:

February 15
August 15

May 15
November 15

The Antique Radio Gazette is published quarterly in Madison, Connecticut

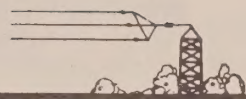
Yearly dues of \$12.00 U.S. currency are payable to ARCA January 1, of each year for members in the USA, Canada, and Mexico. Overseas dues are \$14, which includes airmail postage.

The Antique Radio club of America was incorporated in the State of Kentucky, in September, 1972. The first meeting was held at the Marriott Motor Inn, Washington D.C., on September 23, 1972. At this meeting, by-laws were read and approved and directors selected. We feel that the inception of this Club is a giant step in bringing together those individuals whose chief interest lies in the area of early radio. We invite all collectors and historians of the subject to join the club. A note to William E. Denk, Secretary, 81 Steeplechase Road, Devon, Pennsylvania 19333, will bring you an application blank by return mail.

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President's Page



The hard work of several people has climaxed and another event-filled conference is over. There are reports and pictures, which will in some small way, give those who were among the unfortunate that were unable to attend, a small glimpse at a very rewarding conference.

We are indeed a very fortunate organization to have at its disposal some of the most talented people I have ever come in contact with. The highlight of the conference depicting "100 Years of Radio" was the special presentation, with a complete full size demonstration presented by James Duffield, on Heinrich Hertz. I can honestly say that it was most informative and one of the best seminars I have ever been privileged to attend.

I am pleased to report that this full-size historical, working display will become part of the Kentucky Highlands Museum's Educational Program.

The events were wonderful. Ed Lyon's presentation on the Catalin process; Mel's Corner; the unbelievable, but believable accomplishments of an oral biography by William Hoy as he told of patents held and contributions made, of radios built for the first commercial airliner to radios provided for the Byrd Expeditions, and even today's modern digital electronics. (For nearly every digital volt meter we buy today, Mr. Hoy receives a royalty).

The W. Va. Chapter walked the last mile in providing entertainment in the way of tours and a couple of surprises also. A BIG THANKS to Bill Davis for allowing us to visit his private collection of Rolls Royces many of which have a great history, and none of them showing a spot of dust.

You may gather from the tone of my letter that I was also excited about the conference. I am sorry that many of you were unable to be with us. There were hundreds of pictures taken, but we will only be able to show you a few. We hope that you will enjoy them.

Mystic, Connecticut will be the site of Conference '89. Make your plans now so all of you can enjoy and be rewarded for what I consider time well spent.

Lloyd McIntyre, President

TREASURER'S LETTER

Members sometimes ask how our Club is doing financially. At the recent Charleston Meet, your Treasurer submitted a detailed Treasurer's Report to the Board of Directors. Following are some highlights.

As of May 31, 1988, the Club's working bank balance was \$6,639.48, divided between checking and savings accounts. This working balance falls as we meet current expenses, and rises as late dues are received and as new members are enrolled. Of course, in this calendar year there are three more GAZETTE issues yet to be published, at a production cost of about \$1,700 per quarterly issue. On the plusside, we also anticipate receipt of several hundred dollars, representing profit from the Meet at Charleston.

In addition to moneys included in our "working balance" referred to above, our Club also has several high-interest money market savings accounts. Included in these accounts are \$9,855 representing principal plus interest from pre-1988 gifts from Honorary Member Harry Houck. The principal in this fund is reserved for special, educational projects of ARCA; interest thereon is available, if needed, to meet excess GAZETTE publication costs. Another \$4,039 represents a recent transfer from our checking account (plus interest) of 5-year dues payments (\$50 each) from ARCA's first eighty 5-year members; we now have a total of 103 such members. A pro-rated portion of this amount will be transferred to our checking account over the succeeding 5 years, to meet Club expenses allocable to these 5-year members. Finally, ARCA has another money market account with a current balance of \$3,533 growing out of a gift by Harry Houck; only the interest from this account, by agreement with Harry, is to be used to finance ARCA's new, annual Harry Houck award, concerning which you will learn more in this GAZETTE.

In sum, it appears that, with continued care in spending, and with continued growth in membership, our Club should continue to be secure financially, with no foreseeable need to raise annual dues.

*Jane and William E. Denk,
Secretary/Treasurer*

NEWS FROM CHARLESTON

June 1988

Another annual meet has become history and to all those who attended, the Charleston chapter would like to extend many thanks for coming and sharing this time with us. The schedule was hectic and space here would not permit coverage of every phase of the meet. Most everything, however, will be covered somewhere in this issue of the Gazette.

From the Flea market to the presentations to the tours to the banquet to the auction and all the other activities, there was plenty to keep you busy. There were 128 people that registered for this meet. The flea market had many nice items and if you took the time to browse and dig, most of those needed small parts could be found. The radio displays in the show room were excellent this year. Following is a brief summary of the awards:

- 1) The Harry Houck Award: John Caperton won this award (for the best display of superheterodyne receivers of both A.C. and battery sets) with one of his Leutz radio sets. This award was presented by Gilbert Houck, nephew of Harry.
- 2) The People's Choice Award: Robert Trauterman won this award (voted by the membership to have outstanding public appeal) with a display of test equipment from the 1920's.
- 3) The Best of Show Award: Ralph Muchow won this award (voted by the judges as having special historical significance or for the most complete presentation of the display and documentation relating to the display) for his well documented early crystal receiver/transmitter designed by aviator/inventor Elmo Pickerell for use in airplanes.
- 4) Special Award: This is presented for an entry or entries that have an outstanding characteristic that may not fit any of the established categories. There were four of these awarded this year. A) Ken McIntosh for his scanning disk television display. B) Jim Duffield for his Henrich Hertz display. C) Rick Harris for the KDKA story display (for the first radio broadcast station, and D) Clyde Trivette for his spark gap transmitter display.
- 5) The J.A. Moore Editorial Award: Larry Babcock won this award (presented annually to an individual for outstanding contribution of an article or series of articles published in the Gazette) for his series of articles on Wurlitzer radios. Mrs. Violet Moore was on hand to present this third

annual award given in memory of her husband.

We want to extend our congratulations to all those who received awards this year. It is with sadness we report that Mr. Peter Dean (the gentleman who recorded the 'Radio' album available from our chapter and whose picture appears on that album) has passed away. He was a very talented songwriter and had written songs for some very notable recording artists. Our expression of sympathy goes out to his family.

In closing, we again want to thank everyone who contributed to make ARCA '88 a success. If you have never attended a National Meet, you have missed out on a grand experience. A common interest is shared, preservation of radios is enhanced, but best of all, new friendships that will stand the test of time are started. We hope to make new friends next year in Mystic, Connecticut. That's all for now.

*W. Blaine Smith
Reporter*

ARCA members were treated to a most captivating lecture by William "Bill" Hoy. Bill is an engineer and inventor, whose career in radio began in 1918 (at age 10), and has continued unabated for 70 years to the present. Thus he has experienced it all, from Galena to digital!

Bill holds over 30 patents in the electrical and electronic fields, and has the distinction of having consulted with many great names in those fields, Edison to name but one.

His experiences are many and varied, from motion picture to high fidelity, and would take more space to relate than is available. One, however, bears relating. He was called upon to design 2-way radio for the Ford trimotor, a very early passenger airliner. The equipment had to be as light as possible, something early radios were not exactly noted for. It also had to stand up to terrific vibration, something that Ford trimotors were noted for. Bill designed the equipment, suspended it with rubber shock cords, and an era began.

Another fascinating page from the intensely interesting history of our hobby. Thanks, Bill Hoy.

*Contributed by Bob Gorham
Charleston Chapter*

EDITORS NOTE: Starting with the next issue of the Gazette, a two part series containing the text of Mr. Hoy's lecture will be published.

RADIO: 100 YEARS AGO

By Jim Duffield, W8BGR

At the ARCA '88 meet in Charleston, WV, we had a display detailing the history of radio and we reconstructed the famous Hertz experiment. Many men have been involved in the history of radio, but Henrich Rudolph Hertz (born 1857 in Hamburg, Germany and most noted for 1888 experiments in electro-magnetics, proving the theories of James Clerk Maxwell) was there in the very beginning. Until these experiments by Hertz, no one had endeavored to develop a practical method of wireless transmission.

Our display contained three posters depicting the history of radio. The first poster concerned the very early (1864) experiments of Mahlon Loomis; the second poster, Hertz's exploits; and the third, all the heros in the development of modern radio.

We recreated the famous Hertz experiment by using a dipole-cut antenna with a spark gap in the center, fed by 30,000 volts and resonating about 150 MHZ. We also used a loop of copper tubing the same length (36") with a fine gap between the ends. Both of these units were mounted on top of our display. When put in use in total darkness, we could draw small sparks in the loop receiver gap. For the convention hall demonstration, we used a small neon light bulb in the gap, which was visible to the audience and discernable up to 5 or 6 feet from the spark transmitter (about the same length as the Hertz experiment in detecting a spark). By rotating the loop, we proved it was in resonance with the transmitting unit.

We also demonstrated a high power A.C. spark gap transmission that was used for long wave bands by Marconi and others. We had a homemade galvanometer set up with a compass and inductor to show the experiments with atmospheric electricity by Mahlon Loomis (who, by the way, conducted many of his experiments in WV and is buried at Terra Alta, WV).

Heinrich Hertz is remembered today by the Hertz halfwave antenna and by naming the frequency of waves in his name (Hertz instead of cycles). He was a man who was honored by Royal scientific societies of his day and given a chair in physics at the University of Bonn, Germany, where he served until his early death at the age of 36 (from an infected tooth). He was a man well ahead of his time, predicting X-rays, microwave theory, radar, and lasers.

Editors Note:

So impressive was Mr. Duffield's display of radio history and equipment used to perform the famous Hertz experiment that a permanent display has been requested by the Kentucky Highlands Museum in Ashland, KY.

OUR NEWEST MEMBERS

Robert L. Priest, Strongville, OH
Anthony B. Parks, Franklin Grove, IL
John H. Stangarone, Springs, PA
Charles V. Humphreys, New Haven, WV
Donald Ray Newman, Manchester, TN
Kenneth Miller, Pittsburgh, PA
Francis Merancy, Bolton, CT
David Fullmer, La Porte, IN
George C. DeTar, Ft. Myers, FL
Gerald Schneider, Silver Spring, MD
Denzil R. Berry, LeSage, WV
Lowell W. Larson, Farmington, VT
Michael Page, Flint, MI
Steve Neal, Edina, MN
Ed Burket, Richmond, VA
D.J. Follett, Erin, Ontario, Canada
Robert and Claudette Renkar,
Southington, CT
Robert Hart, Westmount, Quebec, Canada
Ralph J. Presutti, Wethersfield, CT
William Dyson, Fairview Park, OH
Thomas Dady, Minneapolis, MN
Stephen D. Graves, McArthur, WV
Donald W. Hovde, St. Paul Park, MN
Victor M. Ricci, Brooklyn, NY
Terry L. McGinnis, Stanley, NC
Fernando M. Martinez, Valencia, Spain
Reinstated:
Hugh McPherson, Charleston, WV
Dr. Larry Wright, Lake in the Hills, IL

CLUB NEWS

The Antique Radio Club Of Illinois
RADIOFEST '88
August 11,12,13th

Holiday Inn, 345 River Road, Elgin, Illinois.
For Reservations Call 312-695-5000. For
Information, Contact: Jeff Avlik, 803 N.
Chicago Avenue, Rockford, IL 61107
815-399-1902

The following list tabulates the winners in the **Old Equipment Contest** at the ARCA National Contest, Charleston, WV, June 1988. The judges for the contest were: Floyd Bennett, Clyde Trivette, John Caperton, Geoff Bourne, Ralph Williams

Best-in-Show	Pickerill 1908 Receiver	Ralph Muchow
People's Choice	20's Test Equipment	Bob Trauterman
Houck Award	Leutz Model L	John Caperton
Display Award	Spark Transmitter & Receiver	Clyde Trivette

Category 1: Crystals and Coherers (Factory)

First	Pickerill 1908 Receiver	Ralph Muchow
Second	BTH Radiola	Larry Babcock

Crystals and Coherers (Homemade)

First	Marconi Coherer Set	Ross Smith
Second	Triple Detector	Tom Burgess

Category 2: Regenerators

First	Paragon Type 2	Charles Mooney
Second	Tuska 222	Merrill Bancroft
Third	Pilot Wasp #3	Ross Smith

Category 3: Superhets

First	Leutz Model L	John Caperton
Second	Mercury Super 10	Larry Babcock
Third	Grunow All-Wave	Jim Duffield

Category 4: Sets with Radio Amps

First	Federal DX 58	Zane Parsons
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Category 5: Radio Advertising

First	AK Signs and Figure	Merrill Bancroft
Second	Midwest Brochure	Clay Seidel
Third	Receivers in form of Station Microphones	Joe Koester
Third	Italian Display Cards	Bob Lozier

Category 6: Speakers (plain Jane)

First	Kapsch & Sohne	Franz Moch
Second	Teletone 60	Dick Desjarlais

Speakers (Exotic)

Special Award	Manhattan Radio	Ted Babcock
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Category 7: All American Fives (Wood)

First	Emerson (Mae West)	Tom Burgess
Second	Emerson AW	Gerald Schneider
Third	Emerson AU-190	Clay Seidel

All American Fives (Bright Phenolics)

First	Coca-Cola	Lloyd McIntyre
Second	Emerson Trio	Kris Gimmy
Third	Trav-ler Clock	Charles Hinkle

All American Fives (Metal/Mirror/Glass)

First	FADA Piano	Joe Koester
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Category 8: Tubes that Tell A Story

First	DeForest Audions	Clyde Trivette
Second	Ostar Ganz	Franz Moch

Category 9: Rare Books

First	Morse History	Jerry Simkin
Second	Armstrong Letter	Zane Parsons
Third	Oliver Lodge	Larry Babcock

Category 10: Test Equipment

First	1920's Display	Bob Trauterman
Second	Supreme Panel	Bruce Tanner
Third	Vomax 900	Lloyd McIntyre

Category 11: Consoles

First	Grebe 160	Zane Parsons
Second	Zenith	Joe Koester

Category 12: Television

First	Jenkins Radiovision	Ralph Muchow
Second	Disk Story	Ken McIntosh
Third	Philco Safari	Walter Johns

Category 13: Transistors

First	Bush Limited	Bob Lozier
Second	Regency Receivers	Jerald Hueber
Third	Crosley Book	Joe Koester
Third	Crosley Hybrid	Larry Babcock

LETTERS

Dear Sir:

Recently, while reviewing an electrical safety standard, I came across some information which may be of interest to the antique radio community. It concerns vacuum tubes which contain radioactive materials.

While tubes containing radioactive elements in small quantities may not be dangerous if the envelope is intact (this depends on the element and the particles it produces when it decays), there is a potential hazard if the envelope should be broken and the gas inhaled. If a radioactive isotope should become lodged in the lung, it takes only a very small amount to cause a problem, due to the immediacy of the lung tissue. Therefore, persons using or collecting these tubes should handle and dispose of them with care.

Gordon Symons
26 Ossington Avenue
Ottawa, Ontario

Gazette Notice

This is to let you know that the group of collectors who have been meeting from time to time on route 272 Adamstown, Pennsylvania--Renningers--Shupps Grove--Hummers Quonset Hut- and other places--now have a notice of meeting changes.

Mel Comer has for some time been mail-

ing out the notices of meetings. The list has continued to grow to well-over a hundred in this unofficial group

An agreement has been reached whereby the Mid-Atlantic Antique Radio Club will from now on be publishing these meeting notices in their monthly newsletter. This is indeed a fine publication with outstanding articles--an ad column--and many interesting items. It is hoped that all the members of this group will now become members of this organization (Mid-Atlantic Antique Radio Club) in order to keep up with meeting notices. Dues are still \$10.00 per year with all the added advantages of this expanded organization. Contact them at 249 Spring Gap South, Laurel, Maryland 20707 for membership.

Mel Comer

ANNOUNCEMENT

Something new has been added to the future success of ARCA!!

Our most generous benefactor--Harry W. Houck--has set up an additional trust fund for the ARCA organization wherein an annual award of a plaque, plus \$100.00, shall be made to a member who contributes most in the way of Gazette articles or outstanding service to this organization.

The guide lines for this award are being promulgated by board members and will be announced later on. This should be considered as an incentive to our mem-

bers and the further success of ARCA. The ARCA organization is deeply grateful for the interest and support given by Harry W. Houck at its inception and the contributions that have been made by this world famous inventor and benefactor.

The Michigan Antique Radio Club Announces

*** EXTRAVAGANZA '88, 3rd ANNUAL

WHEN:

July 22 & 23, Friday and Saturday
Starts at Noon of Friday

WHERE:

Dillon Inn in Lansing, Michigan
For Reservations call (517) 627-8381

ACTIVITIES:

Swap meet both days, inside auction Friday night conducted by Steve Waldron, equipment contest, donation auction, hospitality area, programs, 50/50 raffles each day, along with buffet luncheon on Saturday (\$6/Person). Registration fees are: **Sellers**, \$5 for MARC members & \$10 for non-members; **Non-Sellers**, \$1 each. For more information and/or to advance register, contact; Jim Clark, 1292 Starboard, Okemos, MI 48864. (517) 349-2249.

Hope to see you there !

BOOK REVIEW **RADIO MANUFACTURERS** **OF THE 1920's VOL. I**

By Alan Douglas 249 pages
The Vestal Press, Ltd., Vestal, NY

If one were required to write a one-word review of this great new book, it might well be "WOW!" That would apply to both printing quality and literary content. Clearly, this is a **must** addition to the library of every collector of broadcast receivers made during the first decade of the broadcast era - 1920's. Collectors of such radios owe a debt of gratitude to fellow Club-member Alan Douglas for putting this book together. It will not be easy for this reviewer to await the arrival of Volumes 2 and 3, promised for the months ahead. These will carry the roster of companies covered all the way to Zenith.

As Alan notes in his Preface, although many books have been written on the technical history of radio and its inventors, and still more on the broadcast stations and personalities, there are really none on the many companies that built all those early receivers. Alan has aimed to des-

cribe (hold your hats!) "every advertised model of each company, whether common or scarce, collectible or not." Almost every company in business three or more years is here. A few that existed before 1920 are treated in some detail, but emphasis is on the twenties, with a clean break at December 1929. Don't look here for those cathedral and midget sets!

The 22-page Preface and Introduction includes a well-illustrated general history of the origins of broadcasting and the manufacture of the first broadcast receivers. This section is followed by 223 pages that take you through more than 23 different manufacturers from A-C Dayton through J.B. Ferguson, Inc. I say "more than" because, for example, under "Crosley", Alan deals also with Precision Equipment Co., and under All American Mohawk he also covers Wurlitzer, with which Mohawk became associated in 1927.

Owning this book is like having 23 booklets dealing with the histories and complete product lines of the companies covered. For example, the Crosley section covers a very comprehensive 35 pages; Amrad, later acquired by Crosley, has its own 39 pages! Included in the Crosley section are roughly 13 pages of straight text. The other 22 pages are loaded with reproductions of full-page Crosley ads and individual pictures of the many Crosley models (I gave up counting) from the various Harko and Ace models through the early A-C operated sets, along with the Musicone and Dynacone speakers.

For Atwater Kent collectors there are 25 pages. Included is a picture of the rarely-seen A-K crystal set, along with one claim and a drawing from Mr. Kent's Patent No. 1,679,310 on the crystal detector unit that is used on his crystal set. You'll learn why so few of these sets are seen.

Congratulations, Alan, on a job superbly done! We appreciated it!

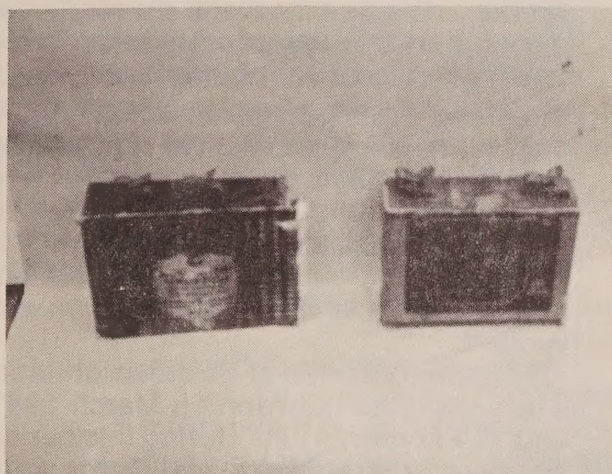
Book Review By
William E. Denk, W3IGU

Note: The hard-cover version of this book sells for \$29.95. The soft-cover version is available from our Charleston, WV Chapter for \$19.95. Include \$1.50 for shipping costs for orders under \$35.00.

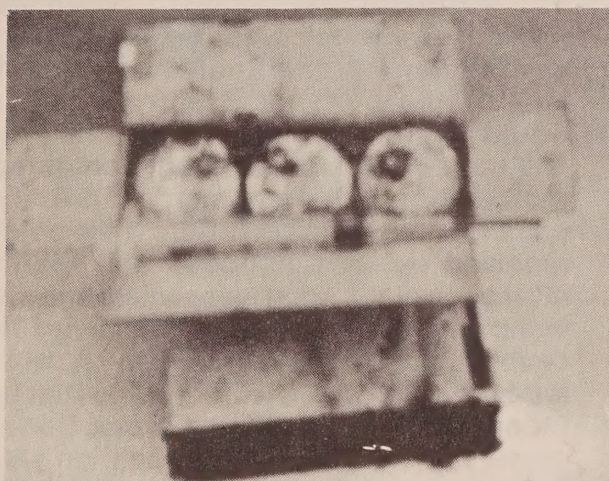
REVIVING OLD "C" BATTERIES & #6 DRY CELL BATTERIES

By John B. Drew

1) The only ones that can be saved are the batteries with no swelling of the cover or discoloration of the label. These batteries have the Zinc outside. About half of the drycells (#6) and about $\frac{3}{4}$ of the "C" batteries can be saved.



(Photo 1 - on the left is an unsalvageable battery. On the right is a good one). Carefully unfold the cardboard bottom exposing the bottom of the batteries. (See Photo 2)



Drill a small hole in each cell about $\frac{1}{8}$ " to a depth of about $\frac{3}{4}$ " with a small "Hypo", Photo 2, slowly insert fresh water into the cells. I fill the hole to the top, and every time I go by the battery, refill it. Takes quite a while for water to soak in: over a period of time it is possible to get into the cells almost $\frac{1}{2}$ pint of water.

Check battery voltage - when it reaches full value, I let the unit set until area around the drilled holes is dry. Then they can be sealed with Duco Cement. You will notice (if enough water has been added), that the batteries are quite a bit heavier than before you started.

I have several batteries done for over a year and they are doing fine; the same procedure with A batteries but a bigger drilled hole and more water.

STRATOVISION II THE FLIGHT TEST PROGRAM

by Larry Babcock

In the SPRING issue of the GAZETTE, I described the 1948 Westinghouse and Martin plan to use a grid of high flying planes, equipped with TV and FM transmitters, to provide economical wide area television service. To obtain test data to support the concept, a large scale test program was planned.

The B-29 Stratovision aircraft is shown in Figure I. This plane was chosen because a large ship was needed to carry all of the necessary TV equipment and personnel. It was also selected because an arrangement was made with the Army to perform airborne propagation tests during the same test period. This article discusses only the Stratovision tests. About 6,000 lbs. of TV equipment were installed. Most of it was designed special or modified as required for high altitude operation, and to fit within the fuselage form factor.

Figure I shows the large TV transmitting antenna mounted vertically below the aircraft chin. This antenna contained the turnstile array for video transmission and a circular dipole for audio transmission. It was necessary to extend this antenna after the aircraft was in the air and retract it to a horizontal position for landing. It was activated by an electrically driven hydraulic pump. There were three auxiliary retraction methods. The first was a hand operated hydraulic pump. The second was a compressed air cylinder which could be connected into the same hydraulic system. The third, and last resort, method was an axe and wrench to chop the cables and drop the whole assembly free from the aircraft! The aircraft could not be landed with the antenna in its lowered position!

The receiving antenna mast is shown on Figure I mounted atop the vertical tail fin of the B-29. This mast was 8' in length and is shown to hold two circular dipoles. The lower was tuned for reception of the FM band. (88-108 M.C.) The upper was used for reception of standard TV stations.

For many stratovision flights, tests were performed by receiving standard FM and TV broadcasts from ground based stations and simply rebroadcasting the signal(s)

on the chin transmitting antenna. Channel 6 was used for all TV rebroadcasts. Problems included ignition noises from the aircraft engines and interference between ground TV stations. With the aircraft flying at 30,000 ft. it was not unusual for reception from a Washington, D.C. TV station to be interfered with by, say, a station in Detroit, Mich. This was temporarily solved by flying at a lower altitude or

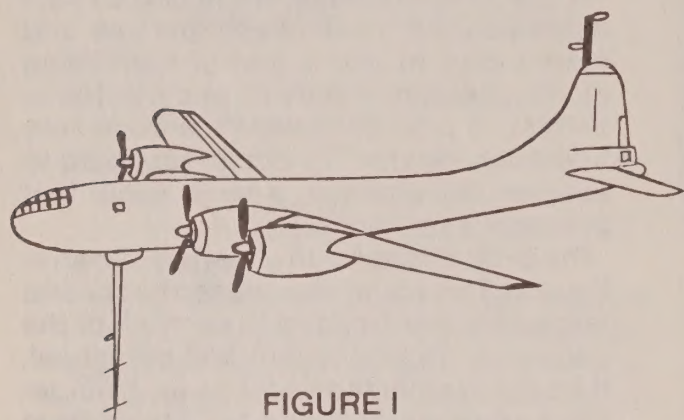


FIGURE I
B-29 Converted for
Stratovision Flights

far west as Dayton and Toledo, Ohio. A letter was also, received from Port Huron, Mich. Eighty-one reports of good picture reception were received. Seventeen reports of fair picture quality were also received.

Reports from several experienced television engineers at stations located approximately 200 miles from the aircraft indicated that except for the ignition noise problem, the quality of the rebroadcasts during the flight was equal to commercial television broadcasting quality.

Stratovision Flights were actually conducted in two phases. The first phase, from 9 Dec. 1945 to 30 Aug. 1946 was performed in a small PV-2C aircraft. It consisted of propagation tests only. No television programs were transmitted but the concept of airborne transmission was verified.

The primary series of Stratovision tests was performed between 18 March 1947 and 17 February 1949. During this period a total of 37 stratovision test flights were made. Most included the transmission of television signals from the B-29. Total B-29 flight time during this series of flights was 164.0 hours. Many flights were performed during the evening hours when the potential viewing audience was greatest. An effort was made to broadcast special events such as the Republican Convention and the Louis-Walcott fight into sections of the country where it would not have been received otherwise.

As the stratovision program continued, the number of viewers increased to the point that hundreds of letters were being received by Westinghouse and Martin after each flight. Most were wildly enthusiastic and hoping that Stratovision would develop into a regular service. A 1948 letter stated, "This is to inform you that on Monday October 11th, the World Series game was received at this location with surprising results, and as far as known was the first time that a television signal has been received in this valley." A letter in 1949 states, "Am writing to you in reference to your recent experiment with Stratovision broadcasting. We received your broadcast very good here in Norfolk, both the video and the sound. Up until now we have had very poor reception from both Washington and Baltimore stations, so we found your broadcast a real treat.

We received you on a Motorola Model VT-71 and a small antenna using no booster. We hope you will soon have steady stratovision broadcasts as it will bring television to so many of us that would otherwise

at a different location. These problems disturbed the test results but, of course, were not pertinent to the ultimate concept.

For the last three Stratovision flights the TV signal was actually generated on board the aircraft. A camera was installed so that slides could be broadcast. Also an image orthicon camera was installed. It was at times pointed out of the nose of the aircraft and scenes of the landscape below were transmitted on channel 6.

The flight of June 9, 1948 was typical. The B-29 took off from Baltimore and flew to a point 25 miles northeast of Pittsburgh while climbing to 25,000 ft. At 7:15 p.m., the picture and sound transmitters were turned on and the programs of WMAR-TV (Channel 2) in Baltimore, MD. rebroadcast on channel 6 until 10:02 p.m. Most of this rebroadcasting was done at 25,000 ft. over the northeast range marker of Pittsburgh, Penn. Few technical problems were encountered. The newly installed air conditioning system kept the equipment cool but there was some ignition noise present in the received signal. This noise was, of course, rebroadcast on channel 6.

After every flight, loads of mail was received. For this flight, enthusiastic reports of reception were received from viewers in nine states! This included New York, Pennsylvania, New Jersey, Maryland, Virginia, Ohio, Michigan and West Virginia. Reports were received from as far east as Port Washington, Long Island, NY. and as

have to do without.”

In October 1948, the Fairmont, West Virginia newspaper stated that, “Hundreds of Fairmonters saw the telecast of the final World Series game as it was received at Ray Murphy’s Radio Electronics shop on Market Street and at Hartley’s where a General Electric receiver was in operation. At Mr. Murphy’s shop on Market street, curious Fairmonters kept the room crowded all afternoon. They came to see an inning or two and went away well pleased with their introduction to television. At one time the crowd was so large that all persons could not get inside the store. Most persons agreed that the reception was quite acceptable considering that it was an experimental telecast.”

What ever happened to stratovision?

Judging from the Flight Test Report it was a great success. It was determined that television signals of high quality could be transmitted long distances - several hundred miles - by placing the transmitter and antenna system at 30,000 ft. The report makes it sound as though stratovision was the way to go in 1949. Yet it never was authorized by the FCC for service. Television has been broadcast from aircraft in more recent times but never with the thought that it could become the major full time method for sending video information to the viewer.

The Stratovision Report has photographs of the staff, crew, equipment installations, and lots of field strength patterns. I will be glad to provide more information to those who are interested.

Aircraft Equipment Included:

- * Link T.V. Receiver - (Westinghouse Composite)
- * Standard Band T.V. Receiver - (Modified 630-TS)
- * 2 FM Link Receivers - (Westinghouse Composite)
- * Communications Receiver - (Hallicrafter S-36)
- * 2 Station Pix. and Line Monitors - (Westinghouse Comp.)
- * Channel #6, 5 Kw. Pix. Trans. - (West. Comp.)
- * Channel #6, 1 Kw, Sound Trans. - (West. Comp.)
- * Channel #6, Side Band Filter - (RCA)
- * Channel #6 Pix. & Sound Transmitting Ant. - (West.)
- * Water Cooling System for Pix. Transmitter
- * 550 Hz, 45 KVA Power system - (West.)
- * 550 Hz, 30 KVA Ground Power Supply - (West.)
- * Communication Transmitter, (AN/ARC-1)
- * Plane Intercom System - (West.)
- * Slide Camera Chain - (RCA TK-20A)
- * Field Camera Chain - (RCA TK-30A)
- * Field Sync. Generator - (RCA TK-30A)

DRY BATTERIES FOR ANTIQUE RADIOS

Introduction

Batteries for antique radios? With all of the modern solid state power supplies available to operate your antique battery radio, who needs ‘em? Besides, batteries would be frightfully expensive and anyway, nobody makes those old radio batteries any more! Right? Wrong!

Do you really want to entrust the filaments of your precious brass-base WD-11’s and UV-199’s to a Jap series pass transistor, or to a Radio Shack 3-terminal regulator? Are you tired of trying to eliminate the hum from that last solid-state power supply you just built? How can you convince people that the Radiola 26 you just carefully finished restoring is really a portable,

if you have to operate it with a power supply?

If you’re interested in answers to the above questions, read on and learn what dry batteries are still available to power your antique radio in the manner it was designed to be powered.

“A” BATTERIES

- 1) **EVEREADY 1S6, 1½ VOLTS:** The standard No. 6 Dry Cell with binding post terminals. Ideal filament power source for sets using WD 11’s, 199’s, 864’s et al. Exact “A” battery for Radiola 24, 26 and others.

“B” BATTERIES

- 1) **BURGESS 4156, 22½ VOLTS:** Small-size “B” battery with binding post terminals. Fits the Radiola 26 portable perfectly (four req’d.) It is as close to

the original as you can get. For moderate operation of the Radiola 26, battery life should approximate the shelf life of the battery. Eveready equivalent is #763.

- 2) **BURGESS 5156SC, 22½ VOLTS:** Combination "B" or "C" battery with spring clip terminals. As a "B" battery it has taps at 19½, 18, 16½, 13½, 12 and 6 volts. Just the thing for providing +16 or +18 volts to tune the plate voltage on a UV-200 or other 'soft detector tube.

As a "C" battery the 5156SC will provide -6, -4½, and -3 volts. Convenient for providing -4½ & -22 volts bias to a Radiola 28, for example.

I have experienced unusually short shelf life with this battery; approximately one year. Make sure you get a fresh one!

- 3) **EVEREADY 762-S, 22½ & 45 VOLTS:** Binding post terminals. A medium sized "B" battery ideal for 1 - 4 tube sets of the Aeriola/Radiola series using WD-11's.

- 4) **BURGESS 10308SC, 22½ & 45 VOLTS:** Spring clip terminals. This is the heavy-duty 1920's- style "B" battery, complete with vintage labeling, that is still in production in 1987! Capable of supplying plate voltage to most any battery receiver you'll likely encounter. For maximum battery life (this is the expensive one) be sure to use a "C" battery with any tubes supplied with more than 45 volts.

Also, check those old B+ bypass condensers in your set. If not shorted they are probably leaky and noisy besides. Get rid of them by hiding a modern cap in the old can. Don't flatten your batteries by letting a leaky old bypass quietly discharge them when you're not looking.

"C" BATTERIES

- 1) **EVEREADY 714, 4½ VOLTS:** A medium-size battery with binding post terminals. An exact fit for the "C" battery 'pocket' in the Radiola Superheterodyne, and possible other sets.
- 2) **BURGESS 5360, 4½ VOLTS:** A small size battery with binding post terminals. Great for adding "C" bias to a set not originally equipped for it, as it can be tucked away inside virtually anywhere.
- 3) **BURGESS 5156SC, 22½ VOLTS:** Spring clip terminals; many taps. (See #2 under "B" batteries for description.)

- 4) **BURGESS 5540, 7½ VOLTS:** Binding post terminals (5) and one wire lead. Has taps at -1½, -3, -4½, & -6 volts. Convenient for biasing a set requiring a variety of bias voltages.

COST

Following are recent prices I've been quoted for radio dry batteries:

BATTERY	EACH
ER No. 6 Dry Cell (1S6)	\$ 5.50
Burgess 5156SC	15.55
Burgess 10308SC	45.71
Eveready 714	11.07
Eveready 762-S	17.54
Burgess 4156	7.75
Burgess 5540	10.47
Burgess 5360	5.13

You may pay more or less than the prices quoted here, depending upon source and quantity purchased of any one type.

WHERE TO GET THEM

First, try your local (if any) Burgess or Eveready distributor. If that fails, contact either (or both) places where I get by batteries:

Cumberland Electronics, Inc.
642 South 20th Street
Harrisburg, PA 17104
(717) 232-9715

contact: Carter Polm,
Industrial Division

Burgess 10308SC
Burgess 5156 SC
Eveready 714
Eveready 7623
Eveready 1S6

Federated Electronics, Inc.
825 Union Blvd.
Allentown, PA 18103
(215) 437-4481

contact: Don Butz, Mgr.

Burgess 10308SC
Burgess 5156SC
Burgess 4156
Burgess 5360
Burgess 5540
Eveready 1S6

MORE INFO

Burgess, Inc.
Foot of Exchange St.
Freeport, IL 61032
(815) 235-8000
contact: Cusu Service
Union Carbide Corporation
Battery Products Div.
Battery Engr. Dept. No. 18
Old Ridgebury Road
Danbury, CT 06817

HARRY SHOEMAKER

An Overlooked Wireless Telegraph Pioneer

By Thorn L. Mayes

PART 3

The U.S. Ship Act of 1912 had placed serious restrictions on wireless transmitters so Shoemaker was faced with a heavy design schedule. To meet the new decrement demands required the use of a new metal container for the leyden jars, with pressure contacts to give better contact with the outside copper coating.

A new inductive coupled tuning helix, with the secondary arranged to tilt, thereby reducing the secondary power was designed to meet the low power requirements when the ship was close to a Government land station.

The advantages of a rotary spark gap, with its distinctive tone, had long been known but the patent litigation between Fessenden and Marconi had prevented United Wireless from using them. An agreement was reached so rotary gaps were designed for the American Marconi sets.

While Shoemaker was with United Wireless, he had designed on paper, a receiving tuner having a loose coupler mounted inside the receiver cabinet, with all controls coming to the front panel. This design was put into production in 1913 as the #101 receiver.

A number of sets of parts for the British Marconi tuner, designed for use with the Fleming valve detector, had been shipped to the U.S. These parts were modified to be used with a cerucite crystal detector and assembled as the #103 receiver.

In 1915 the #106¹⁵ receiver was introduced that was to become the standard marine receiver until the vacuum tube detector became available after WW-I. It was equipped with two cerucite crystal detectors mounted on the front panel. Its tuning range was 200 to 3500 meters (1500 to 85 KC).

When RCA was formed in 1919, drawings, patterns and tools for building the P-8 transmitter and 106 receiver, were sent to Schenectady, where General Electric continued to build them for a number of years. The transmitter was not modified but was later replaced by a tube transmitter. The 106 receiver was modified by G.E. to use an audion detector instead of the two crystal detectors. The length of

time these sets were in use indicates their excellence.

Cost of installing and hooking up the various parts of a transmitter in the field were excessive. Shoemaker saw the advantages of having a packaged set that could be handled as a single unit. Shoemaker hired a German engineer named Ellenschneider, who had worked for Telefunken designing panel sets, and assigned him the job of mounting the parts for the P-8 2KW and the P-5 ½Kw transmitters in cases, with the motor alternator on the base, and equipped with either quenched gap on the front panel or synchronous rotary gap on the alternator shaft.

In mid 1915, Fred Sammis retired as chief engineer of American Marconi, and Roy Weagant was made chief engineer. It would seem that based upon his 100 patents on wireless equipment, and his accomplishments when chief engineer of United Wireless, and as chief development engineer for American Marconi, that Shoemaker would have been made chief engineer. It is said that when Shoemaker owned the International Telegraph Construction Co., that Marconi visited him and accused him of infringing Marconi wireless patents and demanded royalty payments. Shoemaker refused to pay insisting that he was not infringing Marconi patents. This incident may have influenced the selection of Weagant.

At the March 1916 meeting of the IRE, Shoemaker presented a paper "Recent Standard Radio Sets," describing in detail the P-4 2KW and the ½ KW P-5 panel transmitters and the #106 receiver.

Later in 1916 he resigned from the American Marconi Co.

In January 1917,¹⁶ Mr. P.R. Mallory formed the Liberty Electric Co. to manufacture much needed wireless equipment for the war effort. Shoemaker was available and joined Mallory as chief engineer of the company.

Mr. Mallory says of the new Co. "Our first contract was for 50 ship transmitters, complete with Crocker-Wheeler motor generators. It is interesting to note that the Navy Department had only one set of blueprints available to prospective bidders and that Shoemaker and I had to wait their availability until Dave Sarnoff had finished his bid for a similar number. Liberty Electric also received contracts from the Signal Corps for quite a number of small receivers."

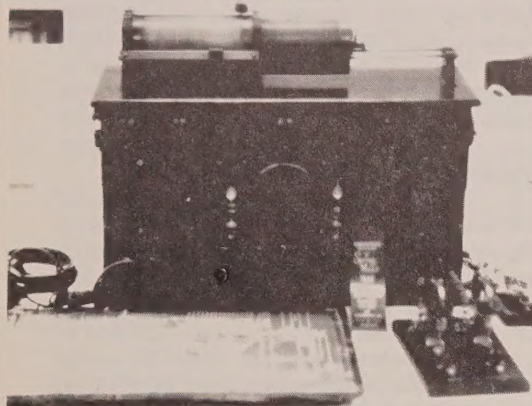
15 Paper by shoemaker, presented March 1916 at IRE meeting describing development of P4 2KW panel transmitter and #106 receiver.

16 Data from incorporation papers, State of Delaware.

ELMO N. PICKERILL

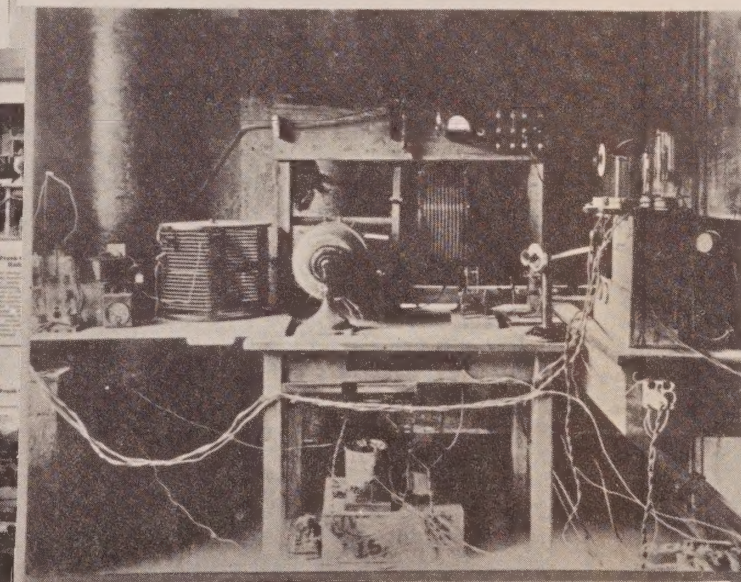
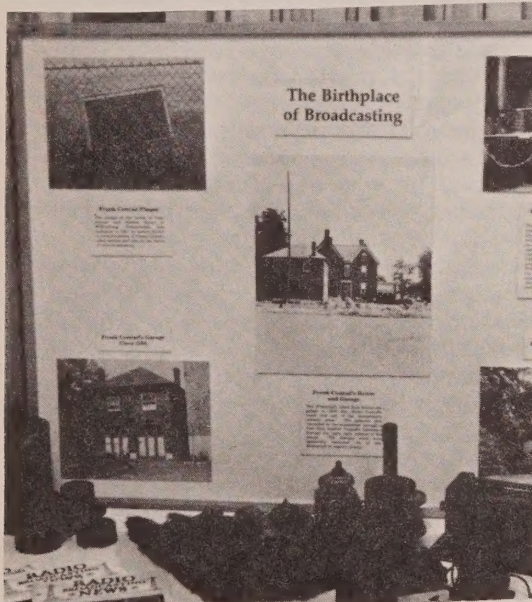


WORLD FAMOUS RADIO AND AVIATION PIONEER
1908 "CRYSTAL SET"



ARCA - 100 YEARS OF RADIO

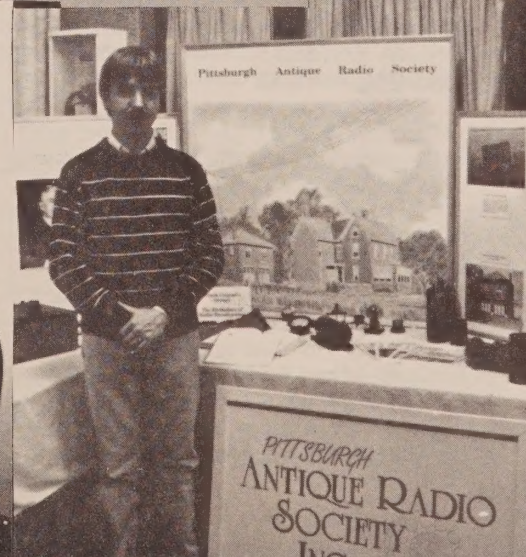
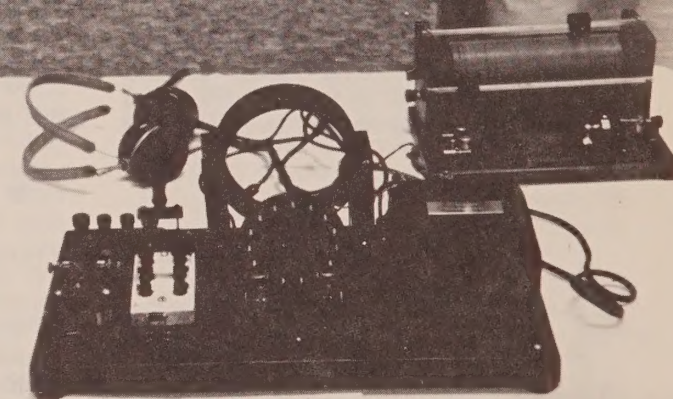
1988 Charleston, WV



The Pittsburgh Antique Radio Society and the Wilkesburg Commission, Inc. are in the process of re-creating Frank Conrad's Amateur station, 8XK, for eventual placement in a museum of broadcasting in Pittsburgh. We need your help in locating items identical or similar to those shown in this photograph from 1920. These items are listed and identified below and many are described in detail in the September, 1920 issue of QST. If you have or know of someone who has equipment that would help us in our re-creation, please contact:

Rick Harris
407 Woodside Road
Pittsburgh, PA 15221
(412) 241-1065

We are also interested in any early Westinghouse equipment or any equipment that Frank Conrad may have helped design or build.



At the end of WWI Liberty Electric completed its Government commitments and was closed. Mr. Mallory then formed the Independent Wireless Telegraph Co.,¹⁷ with Shoemaker as chief engineer. In 1925 Shoemaker resigned, and in 1927 the company was taken over by RCA.¹⁸

Shoemaker continued as a radio consultant until early 1932 when he again joined the Mallory Co., to work on the development of dry plate rectifiers. When the Mallory Co.¹⁹ moved from New York City to Indianapolis, Indiana Shoemaker did not want to leave the New York City area. He then went to work in the laboratory of Samuel Reuben in New Rochelle N.Y.

On August 23, 1932,²⁰ while conducting research, he suffered a cerebral hemorrhage and died. He was survived by a wife and two children.

Thus ended the career of a wireless pioneer who was chief engineer of the first wireless communication company formed in the U.S., who gained national and international recognition for the quality of the equipment he designed and

built, and for his contributions to the advancement of the industry due to his over one hundred patents covering improvements in wireless equipment.

Shoemaker had completed his last design work when Liberty Electric closed its doors in 1919. Small power tubes were just becoming available for experimental work. The war was over and a whole new group of engineers were busy applying tubes to radio equipment. Spark was out and so was Shoemaker as he did not elect to get into this new industry. He lost contact with the new engineers and their advancements, so he soon became an, "Overlooked Wireless Telegraph Pioneer".

- 17 Data from incorporation papers, State of Delaware.
- 18 Letter to T.L. Mayes from J.H. Birmingham of R.C.A. August 14, 1974
- 19 From obituary by R.H. Marriott IRE Feb. 1933.
- 20 Ibid.

Professional History of Harry Shoemaker

Company	Position	Start	Stop
Am. Wireless Tel. & Tel. Co.	chief Eng.	Nov. 1899	Feb. 1902
N.W. Wireless Tel. & Tel. Co.	chief Eng.	Nov. 1899	Feb. 1902
Consolidated Wireless Tel. & Tel. Co.	chief Eng.	Feb. 1902	Feb. 1903
International Wireless Tel. & Tel. Co.	chief Eng.	Feb. 1903	Jan. 1904
Am deForest Wireless Telegraph Co.	chief Eng.	Jan. 1904	Sept. 1904
International Telegraph Const. Co.	Owner	Sept. 1904	July 1908
United Wireless Telegraph Co.	chief Eng.	July 1908	Sept. 1912
Am. Marconi Wireless Tel. Co.	chief. Dev.	Sept. 1912	late 1916
Liberty Electric Co.	chief Eng.	Jan. 1917	Feb. 1919
Independent Wireless Telegraph Co.	chief Eng.	Feb. 1919	1925
Radio Consultant		1925	early 1932
P.R. Mallory Co.	dev. Eng.	1932	Aug. 1932
Died			

MEL'S CORNER



There comes a time when some of our older collectors look around their collections and wonder, "What happens to all this--should something happen to me??"

No doubt this occurs on a rainy day--not feeling up to par--as they sit there and contemplate the future. It's a rather sad situation but it has some brighter spots!

We tend to collect the radio items which we were most familiar with in the past. The memories of when we tinkered with this and that--all to get better performance--and those sought after DX stations!! What a thrill it was then to discover some new wiring diagram--or component in Radio News--QST--and other publications! The many stories and descriptions of the experimenters who came up with new wrinkles. How this antenna worked best--how different coil windings--variable grid leaks--shielding--tap switches and the like outperformed others? Trial and error were the talk of the times!

Riding the old commuter trains going into New York City in the early mornings--regular commuters, sleepy-eyed from late night listening in, would congregate in certain cars to discuss their findings--and boast of the distant stations received! Many radio problems were solved on those trains--plus a few dumb arguments!

One morning in particular comes to mind when this spark station operator arrived with a weary look. The night before he had reached another "sparker" some four hundred miles away! While he was reaching over the bench to adjust his oscillation transformer, his belly touched the key--which was alive!!! The resulting shock knocked him back--as his elbow hit the receiver which crashed to the floor with an ungodly scream!! His wife jumped out of bed--came running --and that was it! In no uncertain terms!!! **All that junk--must go!! No more!!**

But again--we sit there with our collections--looking over many familiar pieces with fond memories. Boil it down to a few? Sell it?? Give it away to a young collector? Or--donate it to a Museum??

Usually what happens is the boiling down process begins. The collection shrinks. Some of those items--still too good to throw away?? So some get packed up and consigned to the attic. Some you wonder--who wants them?? Who needs them?? Space is needed--therefore--out into the trash they go!! How many times this all happens!

The last things to remain are all the books--catalogs--magazines of the past---several keys taking up small space. Eventually the collector's wife becomes a widow. The problems begin. She is beseeched with callers who want to buy. True values are unknown then. Prominent museums are always on the lookout for items of interest and artifacts--usually any condition. Here is a source many overlook. How great it is to have many of these items preserved and enjoyed for generations to come! Perhaps there are certain tax advantages available in some cases. This should not be ignored. These items were enjoyed in the past--why not let others who appreciate them now, enjoy them as well?

Recently we have heard of three prominent collectors who started counting their birthdays and decided it was about time to start a boil-down of their collection.

All three never missed a radio meet or an opportunity to acquire rare or interesting items to add to their collection! The fun was in the finding and the getting!! Further, the fun was in the restoring--and thoughts of receiving ribbon awards at old gear contests. The search for missing parts to complete a project was always a hassle. The satisfaction of a beautiful display of the early gear prodded these collectors to ever-increasing heights of perfection!!

As the collection grew, so did their host of friends and acquaintances multiply by leaps and bounds! All in all--our radio hobby has greatly contributed to our outlook on life! Problems melt away as our minds concentrate on the history and developments of the past--and the future we see in the expansion of electronics.

All this is a matter of concern to our older collectors. Collect what they may?? It's a matter of heritage--and sometimes a matter of dollars. One thing is for sure! Nothing in this world of ours is permanent!!! Except Change!!
Cheerio!!

Old-timer's Notebook

James A. Fred



OLD-TIMER'S NOTEBOOK

James A. Fred

All Rights Reserved

Route #1, Box 41
Cutler, IND. 46920

Q. Dear Old Timer: I need to find a reliable method of testing a 7 inch Electrostatic picture tube such as a 7JP4. I have a fairly new B & K picture tube tester. Can it be adapted to test a 7JP4? is there a circuit I can build to test and rejuvenate them? Doug Heimstead, 1349 Hillcrest Drive, Fridley, MN 55432.

A. Dear Doug: You have just asked a question I cannot answer from my own practical experience. I would think that you could duplicate the power supply of a 4 inch TV set, add a few meters and a signal source and have a good tester.

If any of the readers of this column has a solution to this problem, please write Doug at the above address. After all, one of the most important aspects of collecting is being able to help a fellow collector.

Q. How can I play my old Atwater Kent, model 20, radio, that requires a horn or cone speaker, when I do not have one?

A. Outside of buying a 2000 ohm magnetic speaker, the only way I know is to use a modern permanent magnet dynamic speaker with a matching transformer.

You can use almost any small output transformer and PM speaker. Connect it as shown in the drawing. I've seen one such hook-up using a 4 inch speaker and output transformer in the base of an Atwater Kent horn. It sounded real good and of course you couldn't see the substitute for the regular reproducer. You can often find AK horns without a reproducer for under \$25.00.

Q. I have a nice 4 tube, table model with a wooden cabinet that doesn't play very loudly. With 25 feet of wire fastened to the antenna connector, I can pick up several stations, but none as loud as I would like. What can I do to pep it up?

A. Since this question has no specific one paragraph answer, I will give you a list of suggestions that will help any old radio. First clean off all the dust and rust from

the chassis. Pay particular attention to the tuning capacitor, being very careful not to bend the plates. Check the line cord for defects. Check the speaker cone for rubbing of the voice coil and for tears in the speaker cone. After you have corrected any defects you have found, pull the tubes and have them tested on a Mutual Conductance Tube Tester. It may be difficult to find new ones, but persist until you have all good tubes in your radio.

Now is the time to measure all the resistors. Replace any resistor that doesn't measure within plus or minus 20% of the original value. Check the fixed capacitors visually for bulging or leaking wax from the cardboard tubes. Replace any capacitor that has a visual defect. Find the capacitor connected from the detector plate to the audio output grid. Disconnect this capacitor from the audio tube grid. With the radio turned "ON", use your voltmeter to measure the DC voltage at the disconnected end of the capacitor. If you measure any voltage at all, replace the capacitor with a new one. This capacitor is supposed to block the flow of DC and feed the audio signal from the detector plate to the audio grid. If any DC leaks through, it will alter the grid bias on the audio tube. This will produce low audio output and audio distortion.

Next move on to the electrolytic filter capacitors and measure the "B+" voltage on both positive terminals of the capacitor. Voltage on the red lead should be at least 110 volts DC and the voltage on the blue lead should be between 90 and 100 volts DC. Perhaps there will be a third section in the capacitor. This section may have a green or yellow lead and be connected to the cathode of the audio output tube. This capacitor could even be a separate unit rated at 25 mfd. at 25 VDC. Without getting technical, the net effect of this capacitor is to increase the volume and improve the base response of your radio. If this capacitor is open or shorted, or if your radio was one of the less expensive models built without a cathode bypass capacitor, you can get at least 20% increase in volume by adding one to the circuit.

There is one more capacitor to check. Some radios will have a capacitor connected from the plate to the screen grid of the audio output tube. Since this capacitor has a "B+" voltage on each end, you check it by unsoldering one end, turning the set "ON", and measuring the voltage at the other end of the capacitor. If you measure any voltage, replace the capacitor.

I have not mentioned turning the adjusting screws of the tuning capacitor or on any coil of IF transformers. To realign any tuned circuit, you must be an advanced technician and have an RF signal generator. Since most collectors are not equipped to do this work, we won't go into the procedures here.

Another thing you can try is a new speaker. I once had a radio that didn't play very loudly and when I couldn't find any bad parts, I decided to try a new 4-inch speaker. I was amazed when the volume almost doubled. The only reason I could think of was a weak magnet in the original speaker. A speaker is only 5 to 7% efficient when changing electrical energy to acoustical energy.

If you have done all the checking and followed our suggestions your radio set should be much improved.

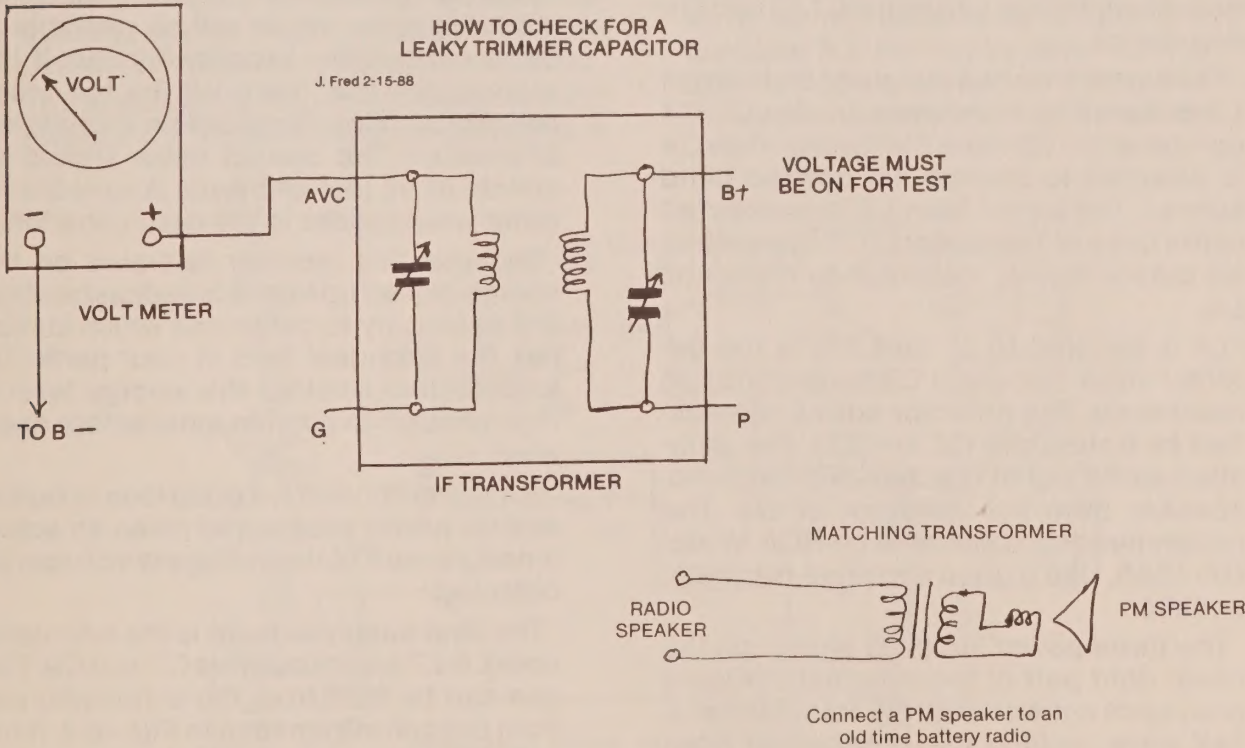
Q. I have a five tube that I cannot get the 2nd IF transformer to peak at 465KC. When I attach my RF signal generator set to 465 KC, I get a definite peak when

adjusting the first IF. With the 2nd IF, I get a gradual increase in signal strength, then a flat response for at least one turn of the adjusting screw, and then a gradual decrease as I finish the alignment. What can I do to correct this problem?

A. Normally you will get a definite peak on your IF alignment. Some IF's were cheaply made and weren't wound with Litz wire or weren't properly wax-impregnated. The wax protected the winding from moisture absorption. The figure of merit of any inductance (coil) is expressed as the "Q" of the coil. The higher the "Q", the better the tuned circuit works. When a coil absorbs moisture, the "Q" becomes very low and the coil no longer works properly. You may be able to improve your IF transformer by removing it from your radio, and putting it into a low temperature oven for 24 hours. Be sure the wax doesn't melt. Reinstall the IF and do a complete alignment. If the IF peaks properly you are home free.

The best solution is to install a pair of new high gain IF transformers. Of course it may be hard to find a pair that look like the original ones. If not, you may be able to mount a smaller IF on the chassis and cover it with the old can. Align the IF's first and then put the old can over the new one using the original mounting holes. When you are through, your set will play better and no one will know it isn't original.

Keep the cards and letters coming, I want to help you with your radio problems.



THE "FREE POWER" RECEIVER

By Bud Bedker

Edited by Ed. Lindberg

Radio receivers, other than the simple crystal set, require an external power source. This can be batteries or the commercial power line. The unusual receiver being described here needs neither of these power sources. The source of power which has been termed "magical" by some visitors, is the energy field generated by a strong AM broadcasting station.

The built-in power supply operates off of RF energy, available free to anyone. The receiver features a crystal detector followed by two stages of transistorized AF amplification. Electrical power is obtained by rectifying unused RF power available from the receiver antenna.

To understand the operation of the equipment, refer to the schematic, Figure 1. The left and upper parts of the figure show the signal pick up and amplifying areas. The power supplies are shown in the lower right section.

The signal from the station being monitored comes in at the antenna terminal and goes through the series network of C1, L1 and L2. The coil L2 rotates inside the L1-L3 assembly, acting to adjust the coupling between L1 and L3. Rotating L2 also changes the inductance of the L1-L2 section. After the optimum coupling between L1 and L3 has been found, it is necessary to trim capacitor C1 to restore resonance.

The signal induced in the secondary coil L3 is tuned to resonance by the C2-C4 combination. C2 does the tuning while C4 is selected to provide the desired band spread. The signal from L3 is connected to the base of Transistor Q1. It appears as an output in the collector to drive coil L4.

L4 is coupled to L5 and this is the detector input. Capacitor C3 tunes coil L5 to resonance. The detector output is amplified by transistors Q2 and Q3. The amplified audio signal reaches the magnetic speaker from the collector of Q3. The recommended speaker is an RCA Model UZ-1325. Use a good sensitive magnetic speaker.

The three power supplies shown on the lower right part of the schematic (Figure one) each consist of an RF transformer, a half wave rectifier and a capacitor filter. The primary of each transformer is tuned to receive the signal from the broadcasting station selected to furnish power.

Capacitor C7 tunes one primary to resonance. It was found possible to use C8 to tune two primaries in series. Two of the supplies produce positive D.C. outputs and the third puts out a negative D.C. voltage.

Separate antenna symbols are shown in the Figure one schematic for clarity. Actually they all connect to the same antenna terminal. The separate ground symbols shown also of course connect to a common ground post.

It will be noted on the parts list that the transistor called for RF amplifier (Q1) is a 2N410. This may be difficult to find. Other types which have been found to function well as the RF amplifier include Motorola type HEP 253. G.E. type 2N123 and the RCA 2N409. Many others were tried and found to function poorly. It is highly recommended that you stick to one of the specified types. If you don't, the result could be much poorer performance. You may wish to purchase a spare since it is possible for this device to be easily destroyed by an electrical storm or improper connection into the circuit. The audio circuit transistors may be purchased at Radio Shack.

It may be questioned why there are a pair of resistors in series across the collector coil of transistor Q1. One resistor would of course do the same job. These are the values that were finally arrived at and the two were left in the schematic to draw attention to the critical value of this part. If the value is too high, the circuit will be unstable at some parts of the broadcast band. If the value is too low, there will be too much damping and the signal will be excessively attenuated. The correct value should be arrived at by trial and error. A variable resistor would assist in the determination.

Because this receiver operates on the energy picked up from a broadcast station, it is necessary to determine which station has the strongest field at your particular location and whether this energy level is high enough to provide satisfactory operation.

For this purpose it is a good idea to build a sample power supply and make an actual measurement of the voltage which can be obtained.

The best supply to build is the one using coils L6-L7 and capacitors C7 and C9. This one can be built from the schematic and from the coil information in Figure 2. If the coils are made according to the dimensions on this drawing the supply can later be incorporated in the finished receiver. For

the first check, use an existing broadcast band AM receiver to find the signal that appears to be the loudest one in the band.

Then try to tune the power supply to this same station. To do this, leave off the filter capacitor C9. Replace it with an 0.001 MFD value and a pair of headphones in parallel. Then you should be able to locate that best station. If not, try to identify the best station that you can hear. From its frequency you can tell how to modify the primary coil, L6, to get resonance at the desired frequency. (Adding turns to coil L6 will lower the tuning band.)

After the desired station has been located, remove the headphones and replace the filter capacitor. Also place a 15,000 ohm resistor across the output of the supply.

Bud had determined that the circuit will perform satisfactorily with a minimum power supply output voltage of 6 volts at a current level of 0.4 ma. The 15,000 ohm resistor will pass 0.4 ma when the output voltage is 6 volts. Place a 20,000 ohms per volt (or higher) meter across the output. Tune the primary for peak output and read the voltage. If the value is at least 6 volts the supplies will perform well at your location.

If the level cannot be brought up to 6 volts, there are a few measures that can be taken. First of all, be sure the station that you are reaching is indeed the best in the band. Some radios are not very linear across the broadcast band, (sensitivity vs tuned frequency). There might be another station that would perform better at your location.

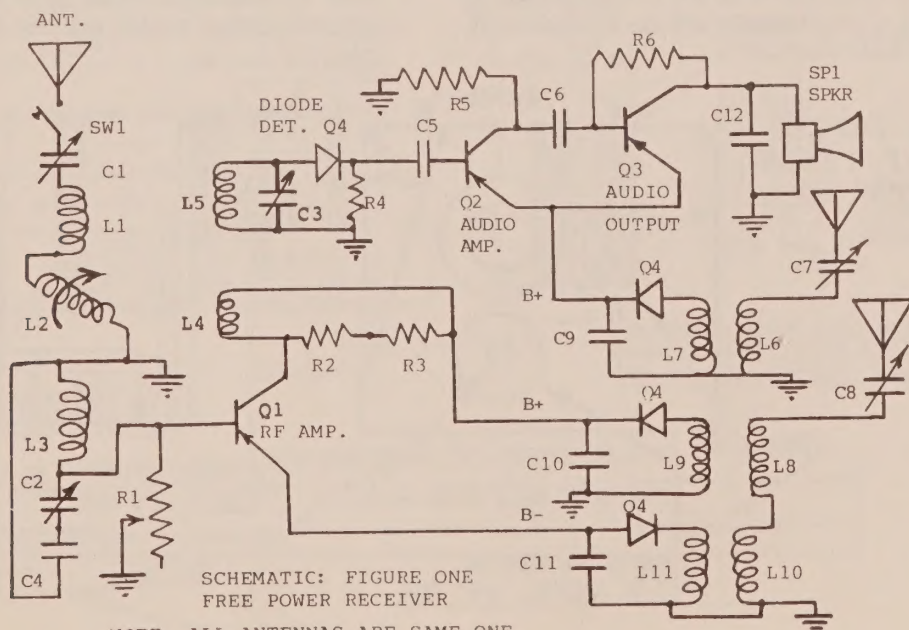
Tune across the band with capacitor C7 and see if a better station can be found. If

the best station does not give a satisfactory voltage, try adding turns to the secondary of coil L7 and observe the effect. If the highest voltage occurs with the plates of capacitor C7 nearly all in (completely meshed), it may be necessary to add turns to the primary of coil L6. Of course, the primary and the secondary, L6 and L7 should also be slid in and out relative to each other to get the highest reading.

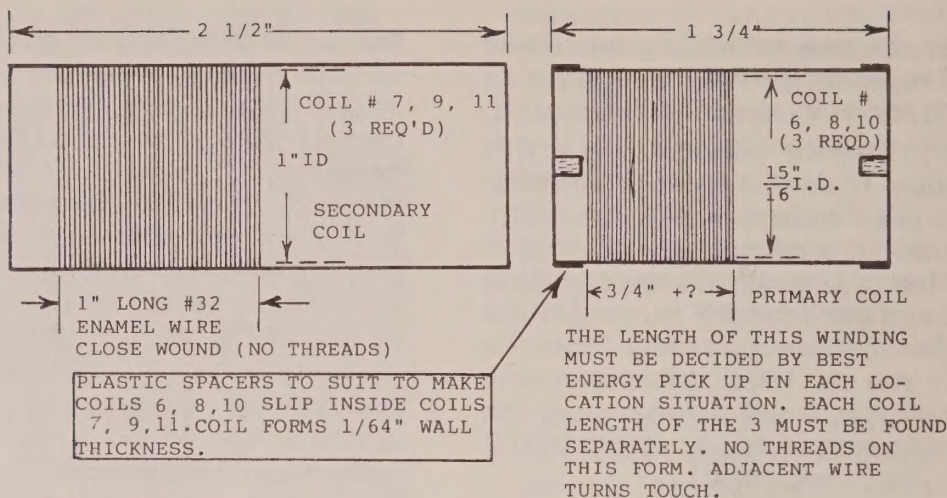
If these measures are inadequate it will probably be necessary to build a higher and/or longer antenna. Be sure to use a good water pipe ground.

A description of the author's antenna might be useful. It is an indoor antenna located in an attic over the second floor of Bud's house. The antenna consists of five lengths of seven strand antenna wire, each 25 feet in length and mounted in parallel lengths spaced 2 feet apart. The far ends are open ended, being supported by glass insulators. The near ends are connected together and connected to the lead-in which goes down through the wall to the room below. The added parallel wires increase the pick up, a valuable feature where space is limited.

Bud uses station WWKB (formerly WKBW) for his power source. It is a 50 kw station located at a distance of about 10 miles air line. WWKB is at 1520 KHz on the AM band. Bud was once asked whether he might have chosen WWKB as a power source because it was a station that he would never want to listen to and in fact he might consider it a service to other listeners to absorb their signal! Bud of course, is far too nice a guy to answer such a question.



NOTE: ALL ANTENNAS ARE SAME ONE.
ALL GROUNDS ARE SAME ONE.



POWER SUPPLY COILS
FIGURE TWO

CONSTRUCTION

The construction of this set is not overly difficult. However it does require painstaking work and close attention to the details in these notes. The work demands some mechanical skill and some previous constructional experience. Access should be had to a metal working lathe, a drill press and the usual hand tools. The details of the construction have been arrived at through a long series of experiments. If much liberty is taken with the details it could well happen that the set will not work at all.

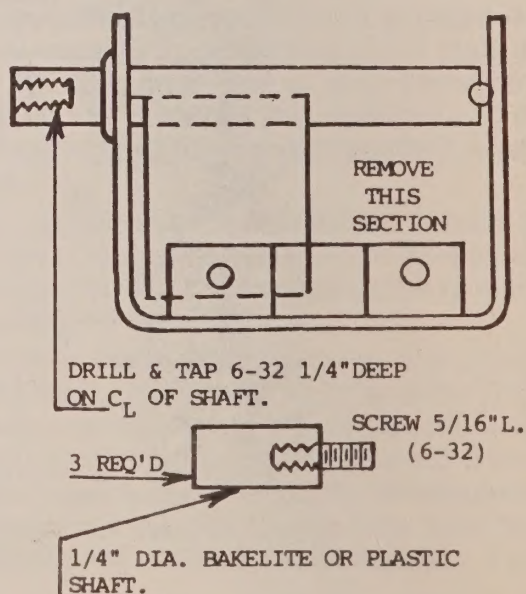
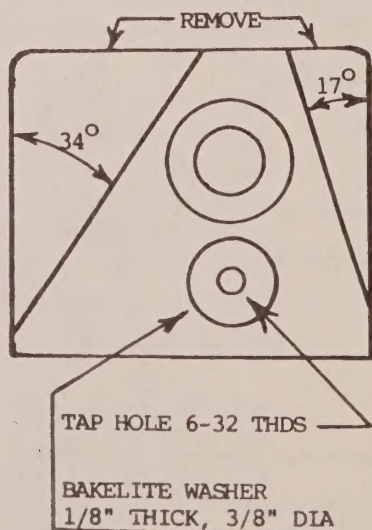
The threaded coil forms are especially important as is the use of the specified small wire size for the coils. If smaller wire is used, the RF resistance will be increased and if the wire is larger the distributed capacity will be higher. This is a loss and amounts to increasing the circuit resistance. Another critical area is energy absorption. If there are large metal parts in an RF field, some losses will be introduced.

Even more critical is the type of material used for the coil forms. Only high grade plastic should be used. If such material as cardboard were to be used, it could absorb moisture and introduce high losses.

The most critical area of the receiver is the antenna input circuit shown at the left side of the schematic. (Figure one). Every effort should be made to reduce the losses in this area. Use thin wall coil forms of high grade plastic and wind the coils according to the specifications given.

The author reduced the losses in the antenna capacitor C1 by reducing the amount of metal in the frame. This was done by carefully sawing off the corners as shown in Figure three. A file was used to smooth the sawed surface. Some of the capacitor plates were also removed from capacitor C1 as it was found that the capacitance was higher than needed to cover the broadcast band and the removal of some plates reduced the bulk of metal in the RF fields.

FIGURE THREE
DETAIL OF TUNING
CAPACITOR, C₁



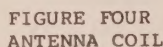
J. Hoffer
24 Cherry Road
Framington, Mass. 01701

The frames of capacitors C2 and C3 may also be cut away as was done with C1, although these circuits are a little less critical as the fields are stronger. If a good grade of low loss capacitor with minimum metal frame bulk can be found, it can perhaps be used without modification.

Mount capacitor C1 to the front panel with a single 6-32 flat head screw. Use a 1/8 inch thick bakelite washer 3/8 inch in diameter as a spacer. Use 3 inch diameter or larger tuning dials for easier adjustment. The set is very selective and large dials

It is a good idea to disconnect the antenna and ground leads from the set when it is not in use. A switch for this purpose is shown in the antenna circuit on Figure one. This same switch can also serve as the on-off switch. Even if an indoor antenna is used, electrical storms could damage the transistors. It is unlikely that the indoor antenna would suffer a direct hit but a nearby lightning strike could induce a high enough voltage in the antenna lead to damage the solid state diodes or transistors. This high voltage you do not need and even though you have a perpetual source of power, you may get tired of hearing the radio play all the time and may wish to give it a rest occasionally.

This set has been found to be a pleasure to operate. It is very sensitive and selective. There are lots of knobs to twiddle but they are fun to adjust. Also the results are very satisfying because the set works so well, the volume is so loud, and you are not paying anything for the power to operate it. Stations as far away as Texas (about 1500 air line miles away) have been received with good volume on a horn speaker.



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WANTED: A new or used Hitachi Vidicon 8758 or equivalent. A possible source of same would be appreciated. Need a 25 k voltage divider for a 'Pilot' "B" eliminator. T.A. Drogoski, 507 Coal Valley Road, Clairton, PA 15025

WANTED: An AK93 shortwave converter and a 1930 or 1931 Radio Amateurs Handbook. Gordon Symonds, 26 Ossington Ave; Ottawa, Ontario K1S 3B4, (613) 232-2198

FOR SALE: Nearly 100 table radios from '30s, '40s, '50s! Cathedrals: Clarion Jr., Crosley 125, Philco 20, Aero Midget, RCA Radiola. Tombstones: Clarion Jr. 320, Zenith 1937 converted farm set, Crosley 1938 Teletune Fiver, Westinghouse mid '30s tiny with repwood front, GE 1937 2 band with rule dial. Plastics: Silvertone 1940s white, red trim, pushbuttons, Silvertone 1937 early black bakelite, Emerson 1940 large brown bakelite. Wood Horizontals: Jackson Bell about 1936, Clarion 1934, American Bosch late '30s, RCA 1941. 612-777-6791 or SASE for list to RIPLEY, Box 9374, North St. Paul, MN 55109

WANTED: Catalin, mirror and novelty radios - Top Prices Paid! Paying over \$1000. For any pre-1943 TV; Buying Post War's as well. Harry Poster, Box 1883, So. Hack, NJ 07606 (201)794-9606 days.

WANTED: Oscilloscopes of the 30s with 3" or smaller CRT. Also want 1 - 3" CRT's & manuals for early scopes. Have many radio's, TV's, tubes, parts, John Kendall P.O. Box 436, Fallston, MD 21047

FOR SALE: 1946 Philco portable model 46-350. \$55.00 & postage. Pic sent upon request. Jim Coleman, P.O. Box 2348, Pasadena, CA 91102 (818) 449-4000 ext. 173

FOR SALE: 1934 Silvertone model 1965 AM-PL-SW restored \$85.00.

WANTED: Early Western Electric equipment. Western Electric Transmitter tubes, and Radio Fiction Books. Charles K. McKee, 6845 Bridge Lake Rd., Clarkston, MI 48016 (313) 625-7067

FOR SALE: for America's most comprehensive Sales List of radios, TVs, speakers, magazines, etc. available, send \$1.50 for my most current list. Also buying radio/tv collections. Jim Clark Enterprises, Dept. ARCA, 1292 Starboard, Okemos, MI 48864. (517) 349-2249

WANTED: I buy radio, TV collections. Please send list and price desired. John Kendall, P.O. Box 436, Fallston, MD 21047

FOR SALE: Delco 1102, (1935, exc., not wkg; hums) \$55 styling is slightly art deco; 2 speed tuning & 3 other controls. Emerson 547A (1947, Exc. works) \$180 (You can see the pilot light thru the cabinet) Send Large 2 stamp SASE for complete and up-to-date photo list. Ron Boucher, P.O. Box 541, Goffstown, NH 03045, (603) 437-2988

WANTED: Bakelite (a/k/a Emerson) Model F radio; Audiola Model 23-S-12 (sold by Allied Radio as 12-tube Class B Super, cat. no. E6832). Need glass dial, info for Philips Model 845X-14-4 radio, c.1936. Jonathan Bouve
24 South Street, Hingham, MA 02043

WANTED: Motorola 5A5, 51M1U, 51M2U, 52M1U, 52M2U "Playmate JR" Zenith 7GO1 AM-FM, RCA 5481 tiny portable. Emerson 558 Jewel-Box, Al Sherry, 5410 Netherland Ave., Riverdale, NY 10471

WANTED: Audio X Formers for General Interstage replacement in old battery radios. Need ten total. R.L. Rumpf, Jr., 605 Teresa Court, Maitland, FL 32751

FOR SALE: G R 213 tuning fork OSC. \$20.00; Stromberg Carlson 501 batt. set, \$150.00; bakelite W D - 11, \$30.00, GA Arcturus tube \$15.00; Federal 417 (see p. 211 of Alan Douglas book) \$200.00;

TRADE: DeForest D7A (no ant.); Federal 57; WD-11's brass tip, good; RCA Victor Lumiere cone spkr. Floyd A. Paul, 1545 Raymond Ave., Glendale, CA 91201 (818) 242-8961

WANTED: Radiola 28, Radiola 25, Radiola 20, Norden Hauck C-10, Leutz Super, Pilot parts, Burns horn, AK bread-board parts, No. 40 magnet wire. E.A. Smith, 2714 Alden Road, Baltimore 34, MD 21234.

WANTED: Any Gillfillan parts that are available. Have trade items on hand - or will buy same. Floyd A. Paul, 1545 Raymond Ave., Glendale, CA 91201

SALE: The 1988 Catalog of numbers of items are listed of old radio gear. Tubes - parts - many things you are looking for to build and restore. Send now for the latest listings. Antique Electronics Supply P.O. Box 1810, Tempe, AZ 85281

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Chambersburg, PA 17201

WANTED: Honey comb coils - any make with following sizes of turns numbers. 100 - 200 - 250 - 1250 - 1500. Prefer mounted plug types. State price and condition. Ross Smith, 1133 Strong Ave., Elkhart, IN 46514

WANTED: Scott McMurdo. Collector would like to purchase sets from the 1930's. Also Arvin Rhythm and Phantom series sets. Mike Greene,
19113 Alpenglow Lane, Brookville, MD 20833 (301)774-3203

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